Network Working Group
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A Standard for the Transmission of IP Datagrams over Experimental Ethernet Networks

Status of this Memo

This RFC specifies a standard method of encapsulating Internet Protocol (IP) [1] datagrams on an Experimental Ethernet [2]. This RFC specifies a standard protocol for the ARPA Internet community.

Introduction

This memo applies to the Experimental Ethernet (3-megabit/second, 8-bit addresses). The procedure for transmission of IP datagrams on the Ethernet (10-megabit/second, 48-bit addresses) is described in [3].

Frame Format

IP datagrams are transmitted in standard Experimental Ethernet frames. The type field of the Ethernet frame must contain the value 513 (1001 octal). The data field contains the IP header followed immediately by the IP data.

If necessary, the data field should be padded to meet the Experimental Ethernet minimum frame size. This padding is not part of the IP packet and is not included in the total length field of the IP header.

The maximum length of an IP datagram sent over an Experimental Ethernet is 1536 octets. Implementations are encouraged to support full-length packets. Gateway implementations MUST be prepared to accept full-length packets and fragment them if necessary. If a system cannot receive full-length packets, it should take steps to discourage others from sending them, such as using the TCP Maximum Segment Size option [4].

Note: Datagrams on the Ethernet may be longer than the general Internet default maximum packet size of 576 octets. Hosts connected to an Ethernet should keep this in mind when sending datagrams to hosts not on the same Ethernet. It may be appropriate to send smaller datagrams to avoid unnecessary fragmentation at intermediate gateways. Please see [4] for further information on this point.

Address Mappings

The mapping between 32-bit Internet addresses to 8-bit Experimental Ethernet addresses can be done several ways.

The easiest thing to do is to use the last eight bits of host number part of the Internet address as the host's address on the Experimental Ethernet. This is the recommended approach.

Broadcast Address

The broadcast Internet address (the address on that network with a host part of all binary ones) should be mapped to the broadcast Experimental Ethernet address (address zero).

Trailer Formats

Some versions of Unix 4.2bsd use a different encapsulation method in order to get better network performance with the VAX virtual memory architecture. Consenting systems on the same Ethernet may use this format between themselves.

No host is required to implement it, and no datagrams in this format should be sent to any host unless the sender has positive knowledge that the recipient will be able to interpret them. Details of the trailer encapsulation may be found in [6].

(Note: At the present time Unix 4.2bsd will either always use trailers or never use them (per interface), depending on a boot-time option. This is expected to be changed in the future. Unix 4.2bsd also uses a non-standard Internet broadcast address with a host part of all zeroes, this will also be changed in the future.)

Byte Order

As described in Appendix B of the Internet Protocol specification [1], the IP datagram is transmitted over the Ethernet as a series of 8-bit bytes.

References

[1] Postel, J., "Internet Protocol", RFC-791, USC/Information Sciences Institute, September 1981.

[2] Metcalfe, R. and D. Boggs, "Ethernet: Distributed Packet Switching for Local Computer Networks", Communications of the ACM, V.19, N.7, pp 395-402, July 1976.

[3] Hornig, C., "A Standard for the Transmission of IP Datagrams over Ethernet Networks", RFC-894, Symbolics Cambridge Research Center, April 1984.

[4] Postel, J., "The TCP Maximum Segment Size Option and Related Topics", RFC-879, USC/Information Sciences Institute, November 1983.

[5] Plummer, D., "An Ethernet Address Resolution Protocol", RFC-826, Symbolics Cambridge Research Center, November 1982.

[6] Leffler, S., and M. Karels, "Trailer Encapsulations", RFC-893, University of California at Berkeley, April 1984.